TEMPORAL ASSESSMENT OF HUMAN ELEPHANT CONFLICTS IN COIMBATORE FOREST DIVISION

YASODHAGAYATHRI. A[1] & C. SEKAR[2]

[1]Research Scholar, Department of Agricultural Economic, Agricultural University, Coimbatore, Tamil Nadu, India

[2]Professor and Head, Department of Social Sciences, Anbil Dharma lingam, Agricultural College & Research Institute, Agricultural University, Tirchy, Tamil Nadu, India

ABSTRACT

The purpose of this study was to examine the temporal pattern of Human Elephant Conflict (HEC) in Coimbatore forest division, Tamil Nadu. The study was aimed at assess the distribution of HEC incident over and within the year and the status of mitigation measures taken by the governing institutions to minimize the HEC. HEC data was collected from the compensation record of Coimbatore Forest Division and analyzed for its temporal pattern by tabular analysis. Results showed that the conflict was raising every year and the mitigation measures taken by Central and State department were of temporary reliefs. Within a year number of incidents was high with the onset of North East Monsoon and reached high during the dry season of every year. This is identical with the harvesting season of Kharif season crop and this escalates the impact of HEC.

KEYWORDS: Human Elephant Conflict, Governing Institutions, Temporary Reliefs

Original Article

INTRODUCTION

Development of any nation depends on its natural resources, by consuming its resources society expands its scale of economic activity and attain the status developed or being developed nation in the world. This resulted habitat fragmentation and ensuing interspersion of human habitation and cultivation has brought wildlife into greater contact with humans, leading to Human Wildlife Conflict. These conflicts got escalated when it comes to large, free ranging mammals like African elephants (*Loxodonta africana*) and Asian Elephant (*Elephas maximus*)(Hoare, 1999).

The interaction interface between elephant and people has resulted in damage to crops, property, livestock and a relatively small number of injuries and fatalities to both. Crop damage by wildlife and especially elephants is not a new phenomenon, but rather has been in existence from the advent of agriculture. The extent of crop depredation by elephants varies across its ranges both in Africa and Asia (Sukumar, 2003). Crop-raiding incidents have been documented at high intensities in fragmented landscapes with low-density elephant population as in northern West Bengal and at low levels in an area with prime elephant habitat and a high density population as in the Nilgiri Biosphere Reserve, South India Sukumar, (2003). The extent of damage is suggested to be higher when there is closer proximity of cultivated lands to elephant habitats.

Human Elephant Conflicts are now widespread in Africa (Thouless, 1994) as well as in Asia (Madhusudan, 2003). This conflicts results in crop depredation and human injury/death during their movement

through fragmented modern landscape (Ramakrishnana, 2008). In response to these conflicts residents take preventive steps like electric fence, crop change etc. while doing so elephants are sometime got electrocuted or injured by residents. This undermine the objectives of elephant conservation initiatives by the Central and State government. In order to understand the dispersion of this conflict, this paper aims to assess the spatial and temporal pattern of Human Elephant Conflict (HEC) in the Coimbatore forest division.

STUDY AREA

Coimbatore district is in the north western part of Tamil Nadu, bordering Western Ghats in the west and Northern side with the Nilgiri Biosphere Reserve, Anamalai and Munnar ranges. Because of the close proximity to Western Ghats, the district is rich in fauns like birds (migratory and non-migratory), elephants, wild boars etc. More than 20 per cent of the district classified as forest providing life support to migratory population of Elephant during North East Monsoon and dry season. Hence Coimbatore Forest Division falls under the Elephant Reserve No. 8, in which Nilambur-Silent Valley of Kerala forms the major portion of the tract. The study area lies between 11° 27' N and 10° 51 N latitude and 77°3' E and 76°39' E longitude. This forest division has a total area of 693.47 km2 in which 590.96 km^2 as core area and 102.50km^2 as buffer area divided into six ranges namely Karamadai, Sirumugai, Mettupalayam, Periyanaickenpalayam, Coimbatore and Boluvampatty. This forest division has a wide ranging altitude from 279m (Bhavanisagar water spread area) to 1801m (Velliangiri Peak). The Coimbatore forest division is drained by two major perennial rivers such as Bhavani and Noyyal. The tributaries of the Bhavani river such as Coonoor river, Kallarpallam, Halurhalla, Thattapallam, Kodungarai pallam, Thekkampatty pallam and Manthorai pallam that are all perennial river flow through the forest division and are available to elephants during the dry season. Figure 1 shows study area map.

Figure 1: Study Area Map; Note: ✸ Study Blocks

The study area receives rainfall both from southwest (May to August) and the North East (September to November) Monsoon (NEM). The major portion of the division gets more rain during NEM. Correspondingly, the major vegetation types vary from tropical thorn forests in the north to mixed dry deciduous forests in the south. Besides, moist

deciduous, semi evergreen and small patches of shola grasslands are also found corresponding to terrain, altitude and rainfall on the west. Agricultural lands are surrounded in the east across the forest division. Among the vegetation physiognomy, species such as *Albizzia amara, Acacia leucopholea, Dicrostachyes cenerea* and *Tectona grandis* comprise the major proportion of trees in the study area. The elephant population in the study area is estimated to be about 65-70 animals. In dry season congregation of elephants can be seen more around the perennial water sources.

DATA AND METHODOLOGY

Statistics on HEC was collected from the range offices in Coimbatore forest division during May 2015. Between 2002 and 2014 there were 2300 incidents of conflict between human and elephant in the study area. These incidents were informed by the victims himself for crop and property damage or by relatives in case of human death or injury. Reported incidents were then verified by the forest guard of concerned beat. Once the incident is verified then the victim has to submit a set of document to make the claim from concerned revenue officers of the government. Each conflict incident was entered with date of occurrences, date on reported, type of damage, compensation claimed and compensation amount sanctioned with demand draft number and date. Compensation claimed and compensation received by the victim will not be same all the time. Government has certain limits for each category of damage. In this present study, we try to identify the spatial and temporal pattern of HEC occurrence throughout the division.

RESULTS AND DISCUSSIONS

Even though the coexistence and conflicts are not a recent phenomenon in the study area frequency of conflicts in the recent decade made it as a serious problem in the region that need to be understood and solved. Data presented in table 1 summarizes the reported conflicts incidents in the region during 2001-2014.

Table 1: Summary of Reported HEC in Coimbatore Forest Division during 2001-2014 (Number)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Overall
2001										1			1
2002	2												2
2003								4				3	7
2004		3		2	1		1	1	1		3	2	14
2005		1				1			2	1	2	1	8
2006	2	2	1	2	1	1		1	7	1		9	27
2007	39	8	22	8	11	17	17	19	5	20	28	196	390
2008	127	110	84	18	48	21	13	10	24	62	99	35	651
2009	113	56	65	11	31	20	48	22	19	40	38	24	487
2010	6	8	14	2	7	11	12	10	17	11	19	23	140
2011	65	17	16	22	10	24	49	18	11	6	44	24	306
2012	64	26	13	25	14	14	19	38	53	18	46	60	390
2013	127	35	26	15	17	27	22	23	26	44	97	171	630
2014	69	39	25	12	21	25	45	11	12	12	20	18	309

This table reveals that number of incidents reported over year was increasing linearly and the changes in this trend was due to the mitigation measures taken by the State and Central governments. This increasing pattern of recorded incidents indicates that the elephants migratory routes were depend on the food and water. Persistent increase in number of

incidents reveals that there are habituated crop raiders in elephants which prefers to raid this region during its migrating season.

As the sensitivity of farms to crop raids by wildlife increased forest department has started to take measures to mitigate or prevent HEC incidents in the region. Table 2 details the information on technology wise extent of mitigating measures taken by the forest department, Coimbatore district.

Table 2: Government's Interventions to prevent HEC in Study Regionm (Km)

S. No	Year	Elephant Proof Trench)	Solar Fence
1	2005-2006	..	6.5
2	2006-2007	..	30.70
3	2007-2008	..	28.50
4	2008-2009	..	43.00
5	2009-2010	3.00	27.00
6	2010-2011	5.50	11.38
7	2011-2012	85.00	2.50
8	2012-2013	111.00	..
9	2013-2014	66.59	..

Source: Forest Department records on Compensation towards HEC
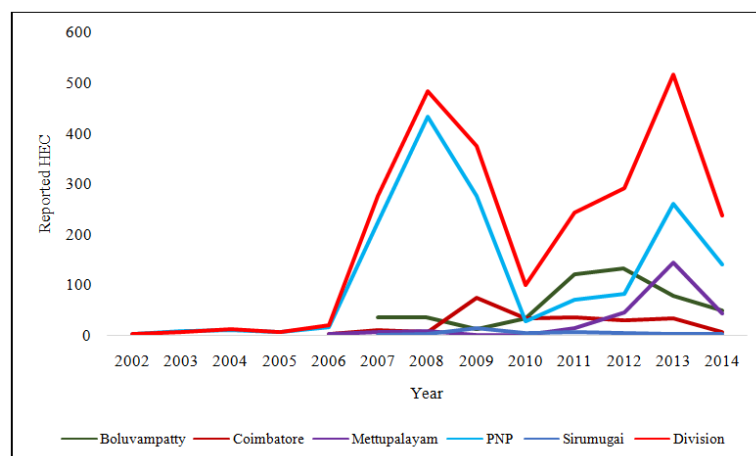

Figure 2: HEC Occurrence in Coimbatore Forest Division
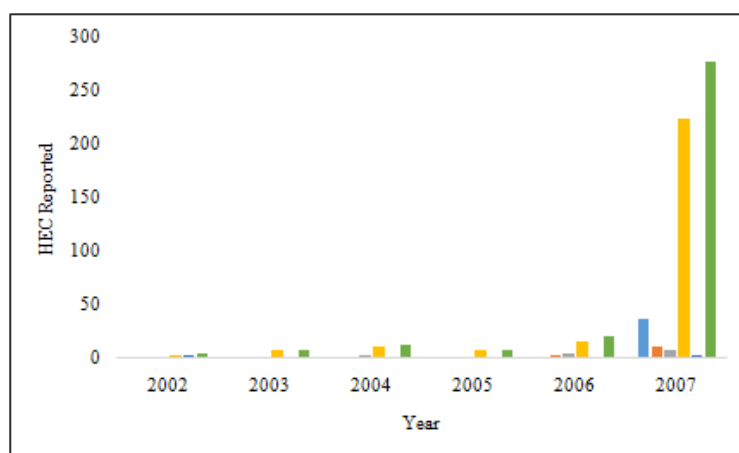

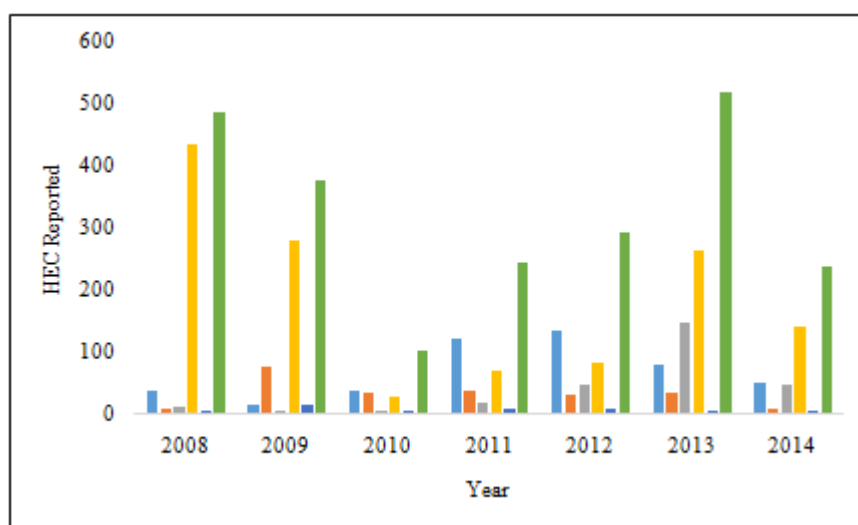**Figure 3: Reported HEC Incidents during 2002-2007**

Figure 4: Reported HEC Incidents during 2008-2014

Number of HEC incidents presented in Figure 2 indicates recorded data did not produce a pattern to foresee the impact of HEC in the future. Because, observed peaks and falls in the division's number of HEC was due to the effect of mitigation strategies followed by the State forest department. Erection of solar fences across the forest boarder was the foremost reason for reduction in the impacts of HEC in the division. Once elephants continued to damage the fence to enter into the farmlands, number HEC incidents were started to rise. Hence the forest department subsequently shifted from solar fence to Elephant Proof Trenches (EPT) and this was considered efficient to reduce conflict. Consequently after certain period of time increasing HEC incidences indicating there are some limitations in the present management strategies which need to be addressed to ensure the harmonious coexistence of man animal in the ecological environment. While comparing the pattern of HEC occurrences in the last decade, Figures 3 and 4 shows that the number of incidents had doubled during the recent days. Even after the measures taken by institutions and farmers, conflicts were raising because of factors like improper maintenance, lack of cooperation etc. within the system. Hence proper understanding of HEC, occurrence pattern and the factors influencing it would serve better to design an efficient management strategy and reduce the impact of HECs in the region.

Seasonal Assessment of reported crop raids in the study region reveals that numbers of incidents were high during a period from October to February. This is the period of receiving second monsoon rain in Coimbatore district which provides the water and food for the migrating population .Number of incidents were started with NEM in October and reached to the peak during dry season during January and February of the year. This season coincide with elephant's migration season (Sukumar, 1989) and kharif crop's harvesting season.
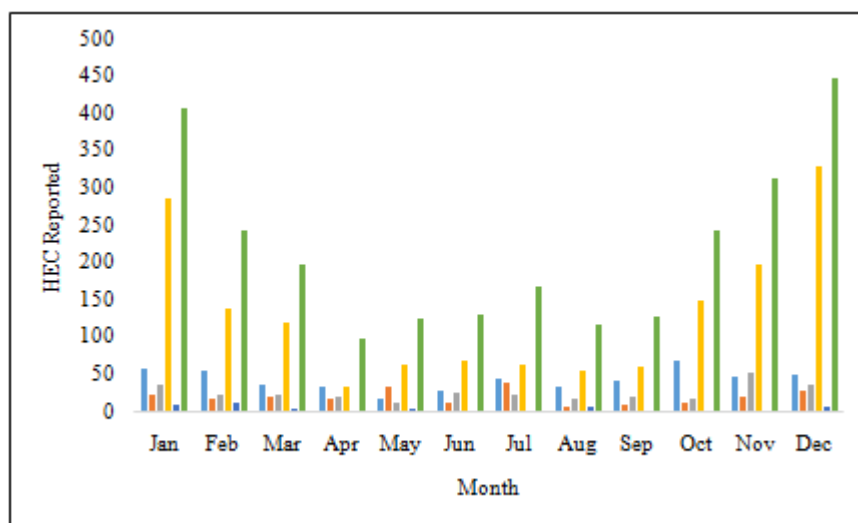
Figure 5: Monthly Distribution of Reported HEC Incidents during 2001-2014

CONCLUSIONS

As the impact of climate change (erratic rainfall) and anthropogenic pressure (Habitat fragmentation) increased the exposure of elephants to the humans. Both elephant migration and agricultural harvest start after the onset of NEM, with the increased exposure and equality in the season escalated the impact of HEC. Since elephant preference over food and path will not change over year explains the reason behind continuously increasing HEC incidents in the study area.

REFERENCES

1. *Hoare, R. E., "Determinants of Human-Elephant Conflict in a Land-Use Mosaic",* ***Journal of Applied Ecology****, 36(5), 689–700, 1999.*

2. *Madhusudan, M. D., "Living Amidst Large Wildlife: Livestock and Crop Depredation by Large Mammals in the Interior Villages of Bhadra Tiger Reserve, South India",* ***Environmental Management****, 31(4), 466–475, 2003.*

3. *Ramakrishnana. B., "Study on Elephant Corridor", Tamil Nadu State Forest Department, 2008.*

4. *Sukumar, R., "Ecology of the Asian Elephant in Southern India. I. Movement and Habitat Utilization Patterns",* ***Journal of Tropical Ecology****, 5(01), 1, 1989.*

5. *Thouless, C. R., "Conflict between Humans and Elephants on Private Land in Northern Kenya",* ***Oryx****, 28(2), 119, 1994*